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STATE OF MONTANA
BULLETIN
OF THE
Department of Public Health

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MONTANA STATE BOARD OF HEALTH

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EMIL STARZ, Ph. D., Bacteriologist.

HELENA, MONTANA.

Published Monthly at Helena, by the State Board of Health.

"The science of disease prevention, if properly applied, can add fifteen years to the present average length of human life."—Prof. Irving Fisher, Yale.

This Bulletin will be mailed monthly to any person in Montana upon request mailed to the Secretary of the State Board of Health at Helena.



At a special meeting of the State Board of Health held December 16th, 1912, the resignation of Dr. T. D. Tuttle as Secretary of the State Board of Health was accepted, and the following resolution, moved by Governor Norris and seconded by Dr. Vidal, was unanimously passed: "Resolved, that we feel that a faithful public servant has been lost to the State in public health work, but that the State is fortunate in having the same man at the head of another important institution, and we desire to express our thanks for the very excellent services he has rendered and wish for him the same success as head of the Tuberculosis Hospital that he has had as Secretary of the State Board of Health."

At the same meeting I was elected to succeed Dr. Tuttle as Secretary of the Board of Health. I realize fully the importance of this office. I also realize that if I keep the pace set by Dr. Tuttle I will have to "go some." The work of the office has been somewhat interfered with on account of the change having occurred just at a time when the work is very heavy. We have been unavoidably delayed in getting out licenses for dairies, etc., but this work is now well advanced.

As soon as possible I shall get around and meet the various local and county health officers over the State. I hope the cordial relations hitherto existing between this office and the health officers will continue. Your co-operation is necessary to the successful administration of the duties of this office. Gentlemen, I will depend upon your support.

W. F. COGSWELL,
Secretary.

Dr. Tuttle's Report on the Investigation of Typhoid Fever Outbreak at Gardiner.

On September 3rd I received a letter from Dr. Shore at Gardiner asking me to go there and investigate conditions relative to an outbreak of typhoid fever. Accordingly I went to Gardiner on September 6th and found the following conditions:

There were six cases of typhoid fever being treated by Dr. Shore at Gardiner. Four cases had been under treatment at the military hospital in the Yellowstone Park. One of these cases had died, the other three were still under treatment. The sanitary conditions in the town of Gardiner are anything but satis-

factory. Manure is pretty well distributed over the town. In addition to this, the river bank is simply one large pile of manure with interruptions in these piles of manure where toilets are placed on the river bank. The town is not incorporated and many individual sewers empty directly into the river, or on the bank and hence indirectly into the river. The sewer from the school house opens onto the river bank immediately above the intake of the city water supply, this city water supply being piped by the Gardiner Power and Light Company. Samples of the water at Gardiner were taken and forwarded to the laboratory for analysis. The report on these samples has not been received to date (September 10th).

The history of the cases of typhoid fever are as follows: First, the cases in the Park. A road repair crew were stationed at a point about half way between Mammoth Hot Springs and Gardiner. Their camp was on the bank of the Gardiner river. Three of the men working in this camp developed typhoid fever, one of them dying from this disease. Major Dr. Blumberg of the Federal Service investigated conditions and it was his belief that the men contracted typhoid fever from drinking Gardiner river water, he having eliminated every other possible source of infection. One of the four cases being treated in the Park contracted typhoid fever at Gardiner.

The cases in Gardiner undoubtedly came from drinking water supplied by the Gardiner Power and Light Company, the intake of their water supply being from the Yellowstone river a short distance below the mouth of the Gardiner river and in addition being subject to pollution from the drainage received from the town of Gardiner. Regardless of what the water analysis may show from a chemical or bacteriological standpoint, I believe that the evidence is clear that this is a water infection.

The question naturally arises, how did the Gardiner river become infected? This is impossible to say. The sources of contamination are comparatively few and yet they are of a peculiarly dangerous character. For instance, among the large number of visitors to the Park each year, it is hard to conceive that there are not many of them who have recently recovered from typhoid or who have not had typhoid within the last year or so, and are therefore typhoid carriers. These people stop at the hotels and camps located at various points in the Park, and while the river is subject to small doses of contamination, this

contamination is of a serious character. The sewage from the Mammoth Hot Springs Hotel empties into an old geyser hole, but ultimately must find its way into the Gardiner river. It is conjectured that it goes through what is known as Bubbling river, a stream of very hot water, and it is possible that this sewage is thus sterilized. The sewage from the camps finds its way into the streams after heavy rains and is a great element of danger, and in this connection I desire to call your attention to the fact that the outbreak of typhoid fever at Gardiner followed a heavy rain storm.

In addition to the transient sewage finding its way into the streams, and the sewage from the hotels, the sewage from the Fort located in the Park empties into the Gardiner river. This sewage naturally carries contamination, but whether it carries typhoid fever germs or not cannot be determined. The typhoid infection of the stream undoubtedly resulted from a typhoid carrier; at least there has been no report of any cases of typhoid fever occurring in the Park this year prior to those incident to the present outbreak. The fact that practically all of the soldiers of the United States army have been vaccinated against typhoid fever would tend to point to other sources of carriers than soldiers located at the Fort, and we therefore assume that the typhoid infection in the Gardiner river above the town of Gardiner resulted from one or more tourists in the Park who were typhoid carriers.

This outbreak of typhoid fever serves as a beautiful illustration of the influence of a small amount of polluting matter on a stream. The fallacy of the old idea that a stream flowing over rocks will be purified in a very short distance is also shown in this instance. It would be difficult to find a stream more turbulent than the Gardiner river.

What can be done about this outbreak? Practically nothing under existing circumstances. All I could do was to tell the people of Gardiner that the typhoid was undoubtedly due to the pollution of the water and urge them to boil their water. This action will have about the same influence that it would have in a community if we made a statement that there was a case of smallpox in the community and urged the people to be vaccinated. Some of them will take the precaution to protect themselves from the disease, but many, and in fact the major-

ity, will take no precaution at all. Therefore we must anticipate other cases of typhoid in this outbreak. The position in which the State Board of Health must necessarily find themselves at present relative to protecting this stream, is a result of the amendments to the sewage pollution law made at the last legislature, and is well illustrated in this outbreak.

The State Board of Health is now called upon to prove that a particular lot of sewage emptying into a particular stream is detrimental to public health. In order to prove this we would necessarily have to take sewage from the fort as a basis to prove in court action the infection of this stream with typhoid fever. This, for reasons stated above, would get in all probability a negative result. The question of finding the typhoid bacillus in a water supply is a very doubtful one in any case. The chances are about as follows: Pour a glass of milk into the Gardiner river at Mammoth Hot Springs Hotel and then try to demonstrate the presence of butter fat in a single drop of water at Gardiner. The chances of striking a drop of water containing a globule of butter fat would be very improbable, and yet imagine the increased chances of striking a drop of water containing a globule of butter fat when every drop that goes through the water system at Gardiner is examined. And yet in order to prove that the sewage of any particular stream resulted in an outbreak of typhoid fever we would have to show the presence of the typhoid fever germ in this particular sewage as it empties into the Gardiner river and then find the particular drop of water taken from the river at Gardiner that contained one or more typhoid germs, and even with this proven we would meet with the rebuttal based on such a statement as this: "The gentlemen have not proven that the particular typhoid fever germ that entered the river at Mammoth Hot Springs is the specific germ found in the water at Gardiner, neither have they proven that any specific bacillus that entered the river at Mammoth Hot Springs was the result of typhoid fever in any one of the individual cases at Gardiner." We can show to the satisfaction of any sanitarian on earth that this outbreak of typhoid fever is due to sewage pollution and that practically any sewer emptying into any stream is a menace to public health, but we cannot prove it to the satisfaction of a lay juror.

In addition to the outbreak of typhoid fever at Gardiner, we have other troubles to anticipate as a result thereof, namely: Typhoid fever now exists at Gardiner. The sewage from numerous private sewer pipes and other toilets located on the banks of the Yellowstone river is emptying into the Yellowstone river directly. This sewage from now on will contain large numbers of typhoid bacillus, which will enter this stream. In addition to this the banks of the Yellowstone river are piled high with manure and other rubbish that furnishes a constant source of pollution to the Yellowstone river, though possibly not at all times containing disease producing germs. This pollution, together with the typhoid germs now entering through the sewage, is now carried down this river. It would be impossible for us to determine the presence of typhoid fever germs at Livingston, and even if we could find this particular germ in the water at Livingston, we could not prove that the particular individual germ found came from Gardiner. But we must anticipate that some of the people drinking the water of the Yellowstone river between Gardiner and Livingston will become infected and that these people living along the banks of the stream will carelessly dispose of their excreta and thus infect the stream, and unless great precaution is taken, we will find a chain of typhoid fever cases extending from Gardiner to Livingston, and how much farther it will extend down the Yellowstone river is merely a matter of conjecture. So far as I can see, the State Board of Health is in a position where they can do nothing except advise the people living along the Yellowstone river to boil all the water used for domestic purposes.

The question might be raised of asking the Federal Government to put in a purification plant at the fort located in the Yellowstone Park, but have we any justification in asking such action on the part of the Federal Government when we, as a state, permit larger bodies of people to empty sewage into our streams? Had we not far better consider the question of taking the beam out of our own eye, before we attempt to take the mote out of his eye? When we clean up our own dirty back yard, it is time enough for us to ask somebody else to clean up his back yard.

Communicable Diseases Reported to the State Board of Health for the Month of December, 1912.

Smallpox—Cases of smallpox were reported as follows: Beaverhead, 4; Great Falls, 1; Fergus, 5; Kalispell, 9; Missoula City, 1; Meagher, 2; Sanders, 9; Butte, 2; total, 33. Total last month, 20. Total December, 1911, 30.

Diphtheria—Cases of diphtheria were reported as follows: Custer, 1; Carbon, 1; Cascade (exclusive of Great Falls), 2; Great Falls, 1; Hill, 1; Yellowstone (exclusive of Billings), 1; Billings, 2. Total, 10. Total last month, 19. Total December, 1911, 26.

Scarlet Fever—Cases of scarlet fever were reported as follows: Great Falls, 3; Gallatin, 3; Madison, 2; Missoula (exclusive of Missoula City), 2; Missoula City, 3; Park (exclusive of Livingston), 10; Livingston, 1; Billings, 1; Silver Bow (exclusive of Butte), 3; Butte, 12. Total, 40. Total last month, 30. Total December, 1911, 26.

Typhoid Fever—Cases of typhoid were reported as follows: Blaine, 1; Hill, 2; Lincoln, 2; Fergus, 5; Lewis and Clark (exclusive of Helena), 1; Helena, 2; Billings, 1; Musselshell, 2. Total, 16. Total last month, 28. Total December, 1911, 17.

Measles—Cases of measles were reported as follows: Dawson, 1; Flathead, 1; Sanders, 1. Total, 3. Total last month, 20. Total December, 1911, 7.

**DEATHS (EXCLUSIVE OF STILLBIRTHS) REPORTED TO THE STATE
BOARD OF HEALTH FOR THE MONTH OF DECEMBER, 1912,
ARRANGED ACCORDING TO COUNTIES AND CITIES.**

| Totals | All Other Causes | Alcoholism | Suicide | Violence | Acute Intestinal Diseases | Malignant Tumors | Organic Heart Disease | Nephritis | Pneumonia | Whooping Cough | Meningitis | Typhoid Fever | Measles | Scarlet Fever | Diphtheria | Tuberculosis | Small Pox | Spotted Fever |
|----------------------------|------------------|------------|---------|----------|---------------------------|------------------|-----------------------|-----------|-----------|----------------|------------|---------------|---------|---------------|------------|--------------|-----------|---------------|
| Beaverhead | 1 | | | | | | | 1 | | | | | | | | | | |
| Broadwater | 4 | | | | | | | | | | | | | | | | | |
| Carbon | 10 | | | | | | | 1 | 3 | | | | | | | 1 | | |
| Cascade (Excl. of) | 5 | | | | | | | 1 | 1 | | | 1 | | | | | | |
| Great Falls | 27 | 13 | | | | | 1 | 1 | 3 | | | | | | | | | |
| Chouteau | 4 | | | | | | | | | | | | | | | | | |
| Custer | 5 | | | | | | | | | | | | | | | | | |
| Dawson | 7 | | | | | | | | | 1 | | | | | | | | |
| Deer Lodge (Excl. of) | 13 | 11 | | | | | | | | | | | | | | | | |
| Anaconda | 3 | | | | | | | | 2 | | | | | | | | | |
| Fergus | 16 | 7 | | | | | | | 1 | 1 | | | | | | 3 | | |
| Flathead (Excl. of) | 7 | 2 | | | | | | 1 | 1 | | | | | | | 1 | | |
| Kalispell | 7 | | | | | | | 1 | 1 | | | | | | | | | |
| Gallatin (Excl. of) | 6 | 2 | | | | | | | 1 | | | | | | | | | |
| Bozeman | 6 | 5 | | | | | | | | | | | | | | | | |
| Granite | 3 | | | | | | | | 2 | | | | | | | | | |
| Jefferson | 1 | 2 | | | | | | | | | | | | | | | | |
| Lewis and Clark (Excl. of) | 19 | | | | | | | | | | | | | | | | | |
| Helena | 4 | 5 | | | | | | | 3 | 3 | | | 2 | | | | | |
| Lincoln | 1 | | | | | | | | | | | | | | | | | |
| Madison | 3 | | | | | | | | | | | | | | | 1 | | |
| Meagher | 6 | | | | | | | 1 | | | | | | | | | | |
| Missoula (Excl. of) | 8 | | | | | | | | | | | | | | | | | |
| Missoula City | 25 | 10 | | | | | | 3 | 1 | 3 | 1 | | | | | 5 | | |
| Musselshell | 3 | | | | | | | | 1 | | | | | | | | | |
| Park (Excl. of) | 2 | | | | | | | | | 1 | | | | | | | | |
| Livingston | 3 | | | | | | | 1 | 1 | | | | | | | | | |
| Powell | 9 | 3 | | | | | | 3 | | | | | | | | 1 | | |
| Ravalli | 4 | | | | | | | | | | | | | | | | | |
| Rosebud | 10 | 1 | | | | | | 1 | | | | | | | | | | |
| Sanders | | | | | | | | | | | | | | | | | | |
| Silver Bow (Excl. of) | 14 | 4 | | | | | | 3 | | | | | | | | | | |
| Butte | 61 | 21 | 1 | | | | | 16 | 1 | 5 | 3 | 1 | 1 | 1 | | 7 | | |
| Sweet Grass | 1 | | | | | | | | | | | | | | | | | |
| Teton | 16 | | | | | | | | | 1 | 1 | | | | | | | |
| Valley | 7 | | | | | | | | | | | | | | | | | |
| Yellowstone (Excl. of) | 8 | | | | | | | | | 2 | | | | | | | | |
| Billings | 12 | 3 | | | | | | 1 | 2 | 2 | 3 | | | | | | | |
| Hill | 5 | | | | | | | | 1 | | | | | | | | | |
| Blaine | | | | | | | | | | | | | | | | | | |
| TOTALS | 357 | 135 | 3 | 12 | 7 | 17 | 36 | 14 | 56 | 3 | 7 | 5 | 2 | 2 | 32 | | | |

| | |
|-----------------------------------------|----------|
| Estimated population | 375,000. |
| Monthly death rate per 1,000 population | .945. |
| Annual death rate per 1,000 population | 11.35. |

**BIRTHS REPORTED TO THE STATE BOARD OF HEALTH FOR THE
MONTH OF DECEMBER, 1912, AND COMPARATIVE BIRTH
AND DEATH RECORD IN THE STATE.**

| | Males | Females | Totals | Deaths | Excess of births | Excess of deaths |
|----------------------------------|------------|------------|------------|------------|------------------|------------------|
| Beaverhead | 1 | 1 | 2 | 1 | 1 | .. |
| Broadwater | 4 | 2 | 6 | 4 | 2 | .. |
| Carbon | 10 | 12 | 22 | 10 | 12 | .. |
| Cascade (Excl. of) | 13 | 8 | 21 | 5 | 16 | .. |
| Great Falls | 15 | 20 | 35 | 27 | 8 | .. |
| Chouteau | 1 | 2 | 3 | 4 | .. | 1 |
| Custer | 6 | 11 | 17 | 5 | 12 | .. |
| Dawson | 17 | 18 | 35 | 7 | 28 | .. |
| Deer Lodge | 3 | .. | 3 | 13 | .. | 10 |
| Anaconda | 6 | 12 | 18 | 7 | 11 | .. |
| Fergus | 19 | 19 | 38 | 16 | 22 | .. |
| Flathead (Excl. of) | 4 | 9 | 13 | 7 | 6 | .. |
| Kalispell | 7 | 4 | 11 | 7 | 4 | .. |
| Gallatin (Excl. of) | 12 | 11 | 23 | 6 | 17 | .. |
| Bozeman | 11 | 8 | 19 | 6 | 13 | .. |
| Granite | 2 | 7 | 9 | 3 | 6 | .. |
| Jefferson | 6 | 4 | 10 | 3 | 7 | .. |
| Lewis and Clark (Excl. of) | 5 | 5 | 10 | 1 | 9 | .. |
| Lincoln | 15 | 12 | 27 | 19 | 8 | .. |
| Lincoln | 3 | 4 | 7 | 4 | 3 | .. |
| Madison | 4 | 8 | 12 | 3 | 9 | .. |
| Meagher | 2 | 7 | 9 | 6 | 3 | .. |
| Missoula (Excl. of) | 9 | 2 | 11 | 8 | 3 | .. |
| Missoula City | 7 | 20 | 27 | 25 | 2 | .. |
| Musselshell | .. | 1 | 1 | 3 | .. | 2 |
| Park (Excl. of) | 5 | 5 | 10 | 4 | 6 | .. |
| Livingston | 4 | 6 | 10 | 6 | 4 | .. |
| Powell | 12 | .. | 12 | 9 | 3 | .. |
| Ravalli | 10 | 11 | 21 | 10 | 11 | .. |
| Rosebud | 4 | 4 | 8 | 4 | 4 | .. |
| Sanders | .. | .. | .. | .. | .. | .. |
| Silver Bow (Excl. of) | 12 | 14 | 26 | 14 | 12 | .. |
| Butte | 44 | 40 | 84 | 61 | 23 | .. |
| Sweet Grass | 6 | 1 | 7 | 1 | 6 | .. |
| Teton | 16 | 13 | 29 | 16 | 13 | .. |
| Valley | 12 | 7 | 19 | 7 | 12 | .. |
| Yellowstone (Excl. of) | 14 | 10 | 24 | 8 | 16 | .. |
| Billings | 13 | 8 | 21 | 12 | 9 | .. |
| Blaine | 9 | 5 | 14 | .. | 14 | .. |
| Hill | .. | 1 | 1 | 5 | .. | 4 |
| TOTALS | 343 | 332 | 675 | 357 | 335 | 17 |

